Having described the invention, what is claimed is:

1. A method of implanting a wafer with an ion beam, the wafer being of the type having a surface area in the form of a disk with a diameter and center, comprising the steps of:

forming the ion beam incident on the wafer; translating the center of the wafer disk along a path intersecting the beam at a translation velocity, simultaneously rotating the wafer substantially about the center at a rotational velocity; and

blanking the ion beam when the ion beam reaches the center of the wafer disk; said translation velocity, said rotational velocity and said blanking being such that the ion beam implants the wafer with substantially uniform dose across the surface area of the wafer.

2. The method of claim 1, wherein the step of translating comprises translating the wafer such that the ion beam implants from one side of the wafer to the center.

3. The method of claim 2, further comprising translating the wafer in a reverse direction back out from said center.

4. A method of implanting a wafer with an ion beam, the wafer being of the type having a surface area in the form of a disk with a diameter and center, comprising the steps of:

forming the ion beam incident on the wafer; determining a beam current density profile of the ion beam; translating the center of the wafer disk along a path intersecting the beam at a translation velocity having a translation velocity profile relative to the position of the beam across the wafer;

simultaneously rotating the wafer substantially about the center at a rotational velocity; and adjusting at least one of said translation velocity profile and said rotational velocity as a function of said ion beam current density profile such that the ion beam implants the wafer with substantially uniform dose across the surface area of the wafer.

5. A method of implanting a wafer with an ion beam, the wafer being of the type having a surface area in the form of a disk with a diameter and center, comprising the steps of:

forming the ion beam incident on the wafer; translating the center of the wafer disk along a path intersecting the beam at a translation velocity;

simultaneously rotating the wafer substantially about the center at a rotational velocity;

tilting the wafer while rotating the wafer such that the ion beam implants the surface area at a substantially constant angle relative to a crystal axis of the wafer.

6. The method of claim 5, further comprising translating the wafer in a direction substantially parallel to the ion beam such that the ion beam implants the surface area with a substantially constant spot size.

7. The method of claim 6, further comprising moving the wafer in said direction parallel to the ion beam a distance proportional to the distance between an impact location of the beam on the wafer and a plane perpendicular to the beam that passes through the center of the wafer disk, so that said impact location is maintained at a substantially constant distance along the ion beam.

8. Apparatus for ion implantation of a wafer having a surface area in the form of a disk with a diameter and a center, the apparatus comprising:

a source of a beam of ions for implanting in a wafer,

a mechanism providing a beam current density profile measurement,

a wafer translation driver operative to translate the center of the disk of the wafer in a direction intersecting the ion beam from said source at a translation velocity having a translation velocity profile relative to the position of the beam across the wafer,

a wafer rotation driver operative to rotate the wafer about a rotation axis through the center parallel to the ion beam at a rotational velocity, simultaneously with translation of the wafer across the beam by said translation driver, and

a controller to operate said translation driver and said rotation driver so that at least one of said translation velocity profile and said rotational velocity is adjusted as a function of the measured beam current density profile to provide a substantially uniform dose implanted by the ion beam over the surface area of the wafer.

9. Apparatus for ion implantation of a wafer having a surface area in the form of a disk with a diameter and a center, the apparatus comprising:

a source of a beam of ions for implanting in a wafer,

a wafer translation driver operative to translate the center of the disk of the wafer in a direction intersecting the ion beam from said source at a translation velocity,

a wafer rotation driver operative to rotate the wafer about a rotation axis through the center parallel to the ion beam at a rotational velocity, simultaneously with translation of the wafer across the beam by said translation driver, and

a tilt axis about which the wafer can be tilted so that the wafer normal is at an angle to the ion beam, said tilt axis rotating with rotation of the wafer about said rotation axis so that the angle of the ion beam relative to the crystal axis of the wafer does not vary with different rotational positions of the wafer about the rotation axis.

10. Apparatus as claimed in claim 9 and including a further translation drive to translate the wafer substantially parallel to the ion beam to keep the impact point of the ion beam on the wafer at a substantially constant position along the ion beam.